



In 2021, the Emergency Event Database (EM-DAT) recorded 432 disastrous events related to natural hazards worldwide. Overall, these accounted for 10,492 deaths, affected 101.8 million people and caused approximately 252.1 billion US\$ of economic losses<sup>2</sup>. As a continent, Asia was the most severely impacted, suffering 40% of all disaster events and accounting for 49% of the total number of deaths and 66% of the total number of people affected. Globally, whilst the number of deaths and the number of people affected were below their 20-year averages, 2021 was marked by an increase in the number of disaster events and extensive economic losses. Five of the top ten most economically costly disasters in 2021 occurred in the United States of America and resulted in a total economic cost of 112.5 billion US\$.

In 2021, a total of 432 catastrophic events were recorded, which is considerably higher than the average of 357 annual catastrophic events for 2001-2020 (Fig.1). Floods dominated these events, with 223 occurrences, up from an average of 163 annual flood occurrences recorded across the 2001-2020 period. During its monsoon season (June to September), India experienced a series of deadly floods that claimed 1,282 lives<sup>3</sup>. In July, the Henan Flood in China was particularly severe, resulting in 352 deaths, 14.5 million people affected, and a cost of 16.5 billion US\$. In the same month, the Nuristan Floods in Afghanistan resulted in 260 fatalities. In July, the Central European Floods and subsequent landslides resulted in 40 billion US\$ of economic costs in Germany alone and stood as the second most costly disaster.

After floods, storms were the second most frequently recorded disaster, with 121 events recorded in EM-DAT in 2021. The number of reported storms was also above the 2001-2020 average of 102 entries per year. Of note, Typhoon Rai, which struck the Philippines in December, resulted in at least 457 deaths and affected 10.6 million people. In April, Tropical Cyclone Seroja passed through Indonesia, claiming 226 lives. Earlier in February, the North American winter storm killed at least 235 people and cost more than 30 billion US\$. Other severe storms that affected the USA in 2021 were Hurricane Ida causing 96 deaths and 65 billion US\$ of economic costs and the tornado outbreaks of December causing 93 deaths and 5.2 billion US\$ of economic costs.

In contrast to floods and storms, relatively few extreme temperature events were recorded in 2021 (three in total) compared to 21 events per year on average between 2001 and 2020. However, the consequences of these extreme temperature events were considerable. At the beginning of April, a cold wave hit France and caused substantial agricultural damage, particularly to vineyards, to the extent of 5.6 billion US\$ in losses. The Western North American Heatwave in June and July 2021 resulted in sharp peaks in excess mortality leading to an estimated death toll of 815 deaths in Canada and 229 deaths in the USA. These latter heatwave events occurred together with wildfires. In general, there were a high number of wildfires in 2021 (19 events) compared to the 2001-2020 average of 11 per year. This is largely attributed to a series of events in the Mediterranean region during the summer period, which affected several countries (Algeria, Bulgaria, Cyprus, Greece, Italy, Macedonia, Tunisia, and Turkey). The deadliest wildfire event occurred in Algeria with 90 fatalities. At the end of 2021, the Marshall Fire event in Boulder County, Colorado, caused economic damage up to 3.3 billion US\$. This makes it the 9th most severe disaster event in 2021 in terms of economic losses in EM-DAT.

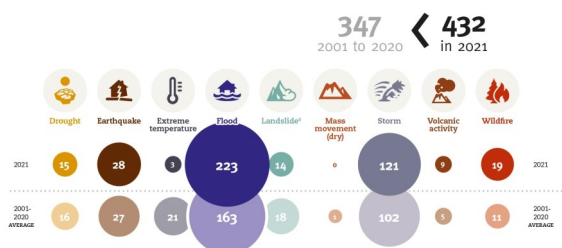


Figure 1: Occurrence by disaster type: 2021 compared to 2001-2020 annual average

1. For the purpose of this report, the term “disaster” is used for natural hazard related disasters reported at a country level, excluding biological and extra-terrestrial disasters.  
 2. For comparison purposes, all economic damages are adjusted using the Consumer Price Index (CPI): OECD (2022), Inflation (CPI) (indicator). doi: 10.1787/eee82e6e-en  
 3 The Indian monsoon season was aggregated as one flood event in EM-DAT.


**Table 1. Top 10 total affected—2021**

 China	Flood	14.5 million	 Somalia	Drought	5.6 million
 South Africa	Drought	12.0 million	 Ethiopia	Drought	5.5 million
 Afghanistan	Drought	11.0 million	 Syrian Arab Rep.	Drought	5.5 million
 Philippines	Typhoon Rai	10.6 million	 Iran (Islamic Rep.)	Drought	2.6 million
 Iraq	Drought	7.0 million	 Kenya	Drought	2.1 million

**Table 2. Top 10 mortality—2021**

 Haiti	Earthquake	2,575	 Afghanistan	Flood	260
 India	Flood	1,282	 USA	Winter Storm	235
 Canada	Heat Wave	815	 India	Landslide	234
 Philippines	Typhoon Rai	457	 USA	Heat Wave	229
 China	Flood	352	 Indonesia	Cyclone Seroja	226

**Table 3. Top 10 economic losses—2021**

 USA	Hurricane Ida	65.0 billion	 France	Cold Wave	5.6 billion
 Germany	Flood	40.0 billion	 USA	Tornado	5.2 billion
 USA	Winter Storm	30.0 billion	 USA	Wildfire	3.3 billion
 China	Flood	16.5 billion	 China	Drought	3.1 billion <sup>9</sup>
 USA	Drought	9.0 billion	 USA	Storm	3.1 billion <sup>9</sup>
 Japan	Earthquake	7.7 billion	 India	Flood	3.1 billion <sup>9</sup>

Besides heat waves, the Western USA encountered persistent drought events in 2021, causing 9 billion US\$ in total economic costs. Worldwide, 15 droughts were reported. Africa (South Africa, Somalia, Ethiopia, Kenya) and Asia (Afghanistan, Iraq, Syria, Iran) were most heavily impacted in terms of the number of people affected (Table 1).

In 2021, EM-DAT reported 28 earthquakes, in line with the 2001-2020 average of 27 events. However, the number of deaths and people affected by earthquakes, as well as global economic damages, were lower in 2021 than the average for the past 20 years. This is due to the absence of any mega-earthquakes in 2021. Despite this, the 7.2-magnitude earthquake in Haiti, which occurred in August, still ranks top as the deadliest disaster in EM-DAT in 2021 (Table 2), causing 2575 deaths. In addition, the Fukushima Earthquake of February (magnitude 7.1) also appears in the top ten of the costliest disasters in EM-DAT in 2021 (Table 3), causing an estimated 7.7 billion US\$ of economic costs.

Other geophysical hazards (volcanic activity, mass movements) and hydrological hazards (landslides) generally had a low occurrence in 2021 and resulted in relatively lower human and economic losses compared to other disasters types recorded in EM-DAT. Nevertheless, in April, a compound event triggered by a rock and ice avalanche resulted in a deadly mass flow in the Uttarakhand state (Himalaya, India). In addition to causing significant damage to hydropower infrastructure, the number of people reported dead or missing was approximately 234, making it one of the top ten deadliest events in 2021. The volcanic eruption of the Cumbre Vieja volcano on the Canary Islands lasted from September to December and stands as the costliest lava flow reported in EM-DAT in the last twenty years, with economic losses estimated at 1 billion US\$.

### CRED updates and recent publications

- Chan, Emily Ying Yang ; Guha-Sapir, Debarati ; Dubois, Caroline ; Shaw, Rajib ; Wong, Chi Sing. *Challenges of Data Availability and Use in Conducting Health-EDRM Research in a Post-COVID-19 World*. In: *International Journal of Environmental Research and Public Health*, Vol. 19, no.7, p. 3917 (2022). doi:10.3390/ijerph19073917.
- Huang, Kai-Sen ; He, Ding-Xiu ; Tao, Qianlan ; Wang, Yan-Yan ; Yang, Yong-Qiang ; Zhang, Biao ; Mai, Gang ; Guha-Sapir, Debarati. *Changes in the incidence and prevalence of ischemic stroke and associations with natural disasters: an ecological study in 193 countries*. In: *Scientific Reports*, Vol. 12, no.1, p. 8p. (2022). doi:10.1038/s41598-022-05288-7

This CRED Crunch issue is adapted from : CRED. '2021 Disasters in numbers', Brussels: CRED, 2022—available at [https://cred.be/sites/default/files/2021\\_EMDAT\\_report.pdf](https://cred.be/sites/default/files/2021_EMDAT_report.pdf)



Data: "EM-DAT: The OFDA/CRED International Disaster Database".

Data are subject to change, for enquires: [contact@emdat.be](mailto:contact@emdat.be)

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